

AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

In the claims

Sub P1
Claim 1 (original): A method for developing an object-oriented computer program that provides externalization of an object in the program, comprising:

including within a program code for providing in memory at runtime a description of an object based on its one or more attributes.

Claim 2 (original): The method of claim 1 wherein the description indicates the location in memory of an attribute.

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Claim 3 (original): The method of claim 2 wherein the description further indicates the amount of space occupied by the attribute.

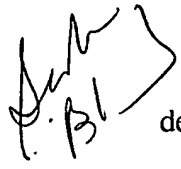
Claim 4 (original): The method of claim 3 wherein the description further indicates the type of the attribute.

Claim 5 (original): The method of claim 4 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 6 (cancelled) ✓

Claim 7 (original): The method of claim 3 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 8 (original): The method of claim 2 wherein the description further indicates the type of the attribute.


 Claim 9 (original): The method of claim 2 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 10 (original): The method of claim 1 wherein the description comprises a list including an entry corresponding to an attribute of the object.

Claim 11 (original): The method of claim 10 wherein the entry indicates the location in memory of an attribute.

Claim 12 (original): The method of claim 11 wherein the entry further indicates the amount of space occupied by the attribute.

Claim 13 (original): The method of claim 12 wherein the entry further indicates the type of the attribute.


 Claim 14 (original): The method of claim 13 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 15 (original): The method of claim 12 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 16 (original): The method of claim 11 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 17 (original): The method of claim 1 further comprising including within the program second program code apart from said object for accessing said description at runtime.

Claim 18 (original): The method of claim 17 wherein the description indicates the location in memory of an attribute.


 Claim 19 (original): The method of claim 18 wherein the description further indicates the amount of space occupied by the attribute.

Claim 20 (original): The method of claim 19 wherein the description further indicates the type of the attribute.

Claim 21 (original): The method of claim 20 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 22 (cancelled)

Claim 23 (original): The method of claim 19 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

 Claim 24 (original): The method of claim 18 wherein the description further indicates the type of the attribute.

Claim 25 (original): The method of claim 18 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 26 (original): The method of claim 17 wherein the description comprises a list including an entry corresponding to an attribute of the object.

Claim 27 (original): The method of claim 26 wherein the entry indicates the location in memory of an attribute.

Claim 28 (original): The method of claim 27 wherein the entry further indicates the amount of space occupied by the attribute.

Claim 29 (original): The method of claim 28 wherein the entry further indicates the type of the attribute.

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Claim 30 (original): The method of claim 29 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 31 (original): The method of claim 28 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 32 (original): The method of claim 27 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 33 (original): The method of claim 17 further comprising including within the program third program code apart from said object for producing a representation of an attribute of the object in a secondary format.

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Claim 34 (original): The method of claim 33 wherein the description indicates the location in memory of an attribute.

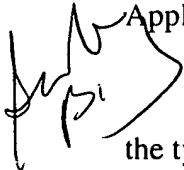
Claim 35 (original): The method of claim 34 wherein the description further indicates the amount of space occupied by the attribute.

Claim 36 (original): The method of claim 35 wherein the description further indicates the type of the attribute.

Claim 37 (original): The method of claim 36 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

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Claim 38 (cancelled)


Claim 39 (original): The method of claim 35 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

 Claim 40 (original): The method of claim 34 wherein the description further indicates the type of the attribute.

Claim 41 (original): The method of claim 34 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claims 42-48 (cancelled) ✓

Claim 49 (original): A method for facilitating the development of an object-oriented computer program that provides externalization of an object in the program, comprising:
supplying program code for providing in memory at runtime a description of an object based on its one or more attributes.

 Claim 50 (original): The method of claim 49 wherein the description indicates the location in memory of an attribute.

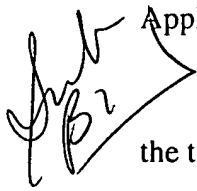
Claim 51 (original): The method of claim 50 wherein the description further indicates the amount of space occupied by the attribute.

Claim 52 (original): The method of claim 51 wherein the description further indicates the type of the attribute.

Claim 53 (original): The method of claim 52 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 54 (cancelled) ✓

Claim 55 (original): The method of claim 51 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.


 Claim 56 (original): The method of claim 50 wherein the description further indicates the type of the attribute.

Claim 57 (original): The method of claim 50 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 58 (original): The method of claim 49 wherein the description comprises a list including an entry corresponding to an attribute of the object.

Claim 59 (original): The method of claim 58 wherein the entry indicates the location in memory of an attribute.

Claim 60 (original): The method of claim 59 wherein the entry further indicates the amount of space occupied by the attribute.

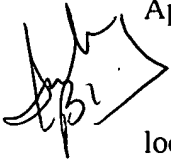
 Claim 61 (original): The method of claim 60 wherein the entry further indicates the type of the attribute.

Claim 62 (original): The method of claim 61 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 63 (original): The method of claim 60 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 64 (original): The method of claim 59 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.


Claim 65 (original): The method of claim 49 further comprising supplying for use by an applications developer second program code for accessing said description at runtime apart from said object.


 Claim 66 (original): The method of claim 65 wherein the description indicates the location in memory of an attribute.

Claim 67 (original): The method of claim 66 wherein the description further indicates the amount of space occupied by the attribute.

Claim 68 (original): The method of claim 67 wherein the description further indicates the type of the attribute.

Claim 69 (original): The method of claim 68 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

 Claim 70 (cancelled)

 Claim 71 (original): The method of claim 67 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

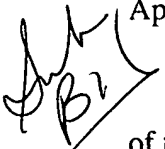
Claim 72 (original): The method of claim 66 wherein the description further indicates the type of the attribute.

Claim 73 (original): The method of claim 66 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 74 (original): The method of claim 65 wherein the description comprises a list including an entry corresponding to an attribute of the object.

Claim 75 (original): The method of claim 74 wherein the entry indicates the location in memory of an attribute.


Claim 76 (original): The method of claim 75 wherein the entry further indicates the amount of space occupied by the attribute.

 Claim 77 (original): The method of claim 76 wherein the entry further indicates the type of the attribute.

Claim 78 (original): The method of claim 77 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 79 (original): The method of claim 76 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 80 (original): The method of claim 75 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

 Claim 81 (original): The method of claim 65 further comprising supplying for use by an applications developer third program code useful for producing a representation of an attribute of the object in a secondary format apart from said object.

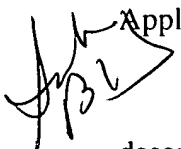
Claim 82 (original): The method of claim 81 wherein the description indicates the location in memory of the attribute.

Claim 83 (original): The method of claim 82 wherein the description further indicates the amount of space occupied by the attribute.

Claim 84 (original): The method of claim 83 wherein the description further indicates the type of the attribute.

Claim 85 (original): The method of claim 84 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 86 (cancelled)


 Claim 87 (original): The method of claim 83 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 88 (original): The method of claim 82 wherein the description further indicates the type of the attribute.

Claim 89 (original): The method of claim 82 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claims 90-96 (cancelled)

Claims 97-144 (cancelled)

 Claim 145 (original): A computer system for developing object-oriented data processing applications that provide externalization of an object in a computer program, comprising:

a CPU;

a memory; and

one or more carriers of digital data signals wherein at least one of said carriers includes a program code signal for providing in memory at runtime a description of an object based on its one or more attributes.

Claim 146 (original): The computer system of claim 145 wherein the description indicates the location in memory of an attribute.

Claim 147 (original): The computer system of claim 146 wherein the description further indicates the amount of space occupied by the attribute.

Claim 148 (original): The computer system of claim 147 wherein the description further indicates the type of the attribute.

Sub B1
Claim 149 (original): The computer system of claim 148 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

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Claim 150 (cancelled)

Claim 151 (original): The computer system of claim 147 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 152 (original): The computer system of claim 146 wherein the description further indicates the type of the attribute.

X
Claim 153 (original): The computer system of claim 146 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 154 (original): The computer system of claim 145 wherein the description comprises a list including an entry corresponding to an attribute of the object.

Claim 155 (original): The computer system of claim 154 wherein the entry indicates the location in memory of an attribute.

Claim 156 (original): The computer system of claim 155 wherein the entry further indicates the amount of space occupied by the attribute.

Claim 157 (original): The computer system of claim 156 wherein the entry further indicates the type of the attribute.

Claim 158 (original): The computer system of claim 157 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Sub B2
Claim 159 (original): The computer system of claim 156 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 160 (original): The computer system of claim 155 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 161 (original): The computer system of claim 145 wherein at least one of said carriers includes a second program code signal for accessing said description at runtime apart from said object.

Claim 162 (original): The computer system of claim 161 wherein the description indicates the location in memory of an attribute.

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Claim 163 (original): The computer system of claim 162 wherein the description further indicates the amount of space occupied by the attribute.

Claim 164 (original): The computer system of claim 163 wherein the description further indicates the type of the attribute.

Claim 165 (original): The computer system of claim 164 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

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Claim 166 (cancelled)

Claim 167 (original): The computer system of claim 163 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 168 (original): The computer system of claim 162 wherein the description further indicates the type of the attribute.

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Claim 169 (original): The computer system of claim 162 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 170 (original): The computer system of claim 161 wherein the description comprises a list including an entry corresponding to an attribute of the object.

Claim 171 (original): The computer system of claim 170 wherein the entry indicates the location in memory of an attribute.

Claim 172 (original): The computer system of claim 171 wherein the entry further indicates the amount of space occupied by the attribute.

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Claim 173 (original): The computer system of claim 172 wherein the entry further indicates the type of the attribute.

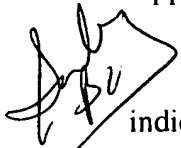
Claim 174 (original): The computer system of claim 173 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 175 (original): The computer system of claim 172 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 176 (original): The computer system of claim 171 wherein the entry further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.


Claim 177 (original): The computer system of claim 161 wherein at least one of said carriers includes a third program code signal useful for producing at runtime a representation of an attribute of the object in a secondary format apart from said object.

Claim 178 (original): The computer system of claim 177 wherein the description indicates the location in memory of the attribute.

 Claim 179 (original): The computer system of claim 178 wherein the description further indicates the amount of space occupied by the attribute.

Claim 180 (original): The computer system of claim 179 wherein the description further indicates the type of the attribute.

Claim 181 (original): The computer system of claim 180 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

 Claim 182 (cancelled) ✓

Claim 183 (original): The computer system of claim 179 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 184 (original): The computer system of claim 178 wherein the description further indicates the type of the attribute.

Claim 185 (original): The computer system of claim 178 wherein the description further indicates a description for the attribute that is based on the attribute's one or more component attributes if the attribute is a second object.

Claim 186-192 (cancelled) ✓
